

From the INTERNATIONAL BUREAU

**PCT**

**NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

To:

Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected Office

Date of mailing (day/month/year) 10 July 2001 (10.07.01)	Applicant's or agent's file reference 150-111(PCT)
International application No. PCT/US00/27501	Priority date (day/month/year) 08 October 1999 (08.10.99)
International filing date (day/month/year) 05 October 2000 (05.10.00)	
Applicant JORDANOV, Valentin, T.	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
23 April 2001 (23.04.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorized officer Odile ALIU</p> <p>Telephone No.: (41-22) 338.83.38</p>
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 18 JAN 2002	
WIPO	PCT

Applicant's or agent's file reference 150-111(PCT)	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/27501	International filing date (day/month/year) 05 OCTOBER 2000	Priority date (day/month/year) 08 OCTOBER 1999
International Patent Classification (IPC) or national classification and IPC IPC(7): H03M 1/18 and US Cl.: 341/132, 139		
Applicant PACKARD BIOSCIENCE COMPANY		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 23 APRIL 2001	Date of completion of this report 02 JANUARY 2002
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer Jean Jeanglaude
Facsimile No. (703) 305-3230	Telephone No. (703) 306-3405

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/27501

**I. Basis of the report****1. With regard to the elements of the international application:\***☐ the international application as originally filed☒ the description:

pages (See Attached)

, as originally filed

pages , filed with the demand

pages , filed with the letter of

☒ the claims:

pages (See Attached)

, as originally filed

pages , as amended (together with any statement) under Article 19

pages , filed with the demand

pages , filed with the letter of

☒ the drawings:

pages (See Attached)

, as originally filed

pages , filed with the demand

pages , filed with the letter of

☒ the sequence listing part of the description:

pages (See Attached)

, as originally filed

pages , filed with the demand

pages , filed with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4. ☒ The amendments have resulted in the cancellation of:**☒ the description, pages none☒ the claims, Nos. none☒ the drawings, sheets/fig none**5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. statement**

Novelty (N)

Claims 1 YESClaims 2-9 NO

Inventive Step (IS)

Claims 1 YESClaims 2-9 NO

Industrial Applicability (IA)

Claims 1-9 YESClaims None NO**2. citations and explanations (Rule 70.7)**

Claims 2, 3, 4 lack novelty under PCT Article 33(2) as being anticipated by Chapman (US Patent Number 4,827,191).

Regarding claims 2, 3, 4, Chapman discloses an adaptive range/DC restoration circuit that receives an analog signal that is to be digitized (abstract). The system of Chapman comprises a peak detection unit (12, fig. 1) which includes a positive peak detector (13, fig. 1) and negative peak detector (14, fig. 1) that detects the local maximum or local minimum of the input signal (paragraph bridging col 1 and 2; see col 2, lines 36 - 54).

Claims 5 - 9 lack an inventive step under PCT Article 33(3) as being obvious over Chapman in view of Mason et al. (US Patent Number 5,194,865) and Kuroiwa (US Patent Number 5,210,538).

Claims 5, 6, 7, 8, 9, Chapman teaches the limitations as set forth above except a method that includes a switching means. However, Mason et al. in a related field disclose an analog to digital converter circuit having automatic range control in which the peak tracker circuit 300 is subsequently enabled to select another peak analog signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a method that comprises a switching means that switches the tracking mode as taught by Chapman as evidenced by Mason et al because Chapman discloses a an adaptive range/DC restoration circuit for the purpose of providing signals representative of positive and negative peaks for the incoming selected analog signal to be digitized and Mason et al desirably discloses an analog to digital converter that including the aforementioned limitations for the purpose of generating a reference potential corresponding to a peak amplitude of the analog signal to be converted.

Both Chapman and Mason et al teach all the as set forth above except a method that stores the value of the tracked value as (Continued on Supplemental Sheet.)

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

**I. BASIS OF REPORT:**

This report has been drawn on the basis of the description.  
page(s) 1-10. as originally filed.  
page(s) none. filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the claims,  
page(s) 11, as originally filed.  
page(s) none, as amended under Article 19.  
page(s) none, filed with the demand.  
and additional amendments:  
PAGES 12 13 FILED WITH THE LETTER OF 21 SEPTEMBER 2001

This report has been drawn on the basis of the drawings.  
page(s) 1-11. as originally filed.  
page(s) none. filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the sequence listing part of the description:  
page(s) NONE, as originally filed.  
pages(s) NONE. filed with the demand.  
and additional amendments:  
NONE

**V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):**

maximum or minimum value and compares a maximum or a minimum value with a threshold value. However, Kuroiwa, in a related field, discloses a glitch detection circuit and method that comprises a storing means (24, 25 wherein the maximum and minimum values are recorded (col 7, lines 10 - 14) and comprises a comparing means (46, 52, fig. 1) that compares a maximum or minimum value with a threshold value (col 1, line 61 to col 2, line 14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a method that stores the value of the tracked value as maximum or minimum value and compares a maximum or a minimum value with a threshold value in Chapman and Mason et al's system as taught by Kuroiwa because Chapman discloses an adaptive range/DC restoration circuit for the purpose of providing signals representative of positive and negative peaks for the incoming selected analog signal to be digitized and Mason et al suggest an analog to digital converter for the purpose of generating a reference potential corresponding to a peak amplitude of the analog signal to be converted and Kuroiwa desirably teach a glitch detection circuit and method including the aforementioned limitations for the purpose of detecting a glitch which is included in an input signal of an oscilloscope.

Claim 1 meets the criteria set out in PCT Article 33(2)-(4). because the prior art does not teach or fairly suggest a digital peak detector as described in claim 1.

----- NEW CITATIONS -----

NONE

### Claims

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A digital peak detector, comprising:
  - (a) a peak register connected to receive a discrete pulse signal at its data input;
  - (b) a subtractor connected to receive said discrete pulse signal at its adding input;
  - (c) said peak register connected so that its output is an input to the subtracting input of said subtractor and is applied to the data inputs of maximum and minimum peak value latches;
  - (d) the output of said subtractor is connected so that its output provides inputs to a comparator and to an exclusive OR gate;
  - (e) said exclusive OR gate is connected so that its output is applied to the enable input of said peak register;
  - (f) a noise threshold digital value is applied to one of the inputs of a data multiplexer and to the input of a negating and scaling unit, the output of which negating and scaling unit is applied to the other input of said data multiplexer;
  - (g) said multiplexer is connected so that its output is an input to said comparator;
  - (h) said comparator is connected so that its output is a data input to a flip-flop;
  - (i) said flip-flop is connected so that its output is applied to the selecting input of said data multiplexer, to an input of said exclusive OR gate, and to the latching inputs of said maximum and minimum peak value latches, and provides a peak detect signal.

2. A method of operating a peak detector, comprising:

- (a) providing said peak detector;
- (b) applying a discrete pulse input signal to said peak detector; and
- (c) using said peak detector to detect local maximum or local minimum of said input signal.

3. A method of operating a peak detector, as defined in Claim 2, wherein said step (c) further comprises: detecting said local maximum or local minimum with threshold.

4. A method of operating a peak detector, as defined in Claim 2, wherein said step (c) further comprises: detecting said local maximum or local minimum with hysteresis.

5. A method of operating a peak detector, as defined in Claim 2, wherein said step (c) further comprises: tracking either rising or falling portions of said input signal.

6. A method of operating a peak detector, as defined in Claim 2, wherein said step (c) further comprises: detecting maximum or minimum of said input signal by switching the mode from tracking maximum to tracking minimum or vice versa.

7. A method of operating a peak detector, as defined in Claim 6, wherein: switching tracking modes includes comparing either maximum or minimum threshold to the difference of the input signal and the tracked peak value.

8. A method of operating a peak detector, as defined in Claim 6, wherein: switching tracking modes includes switching from tracking maximum or tracking minimum to tracking minimum or tracking maximum when the absolute value of the difference between the maximum or minimum threshold and the difference between the input signal and the tracked peak value is greater than the maximum or minimum tracking threshold.

9. A method of operating a peak detector, as defined in Claim 6, further comprising: generating a peak detect signal and storing the value of said tracked peak value as maximum or minimum value at the point of transition from tracking maximum to tracking minimum or vice versa.



1/11

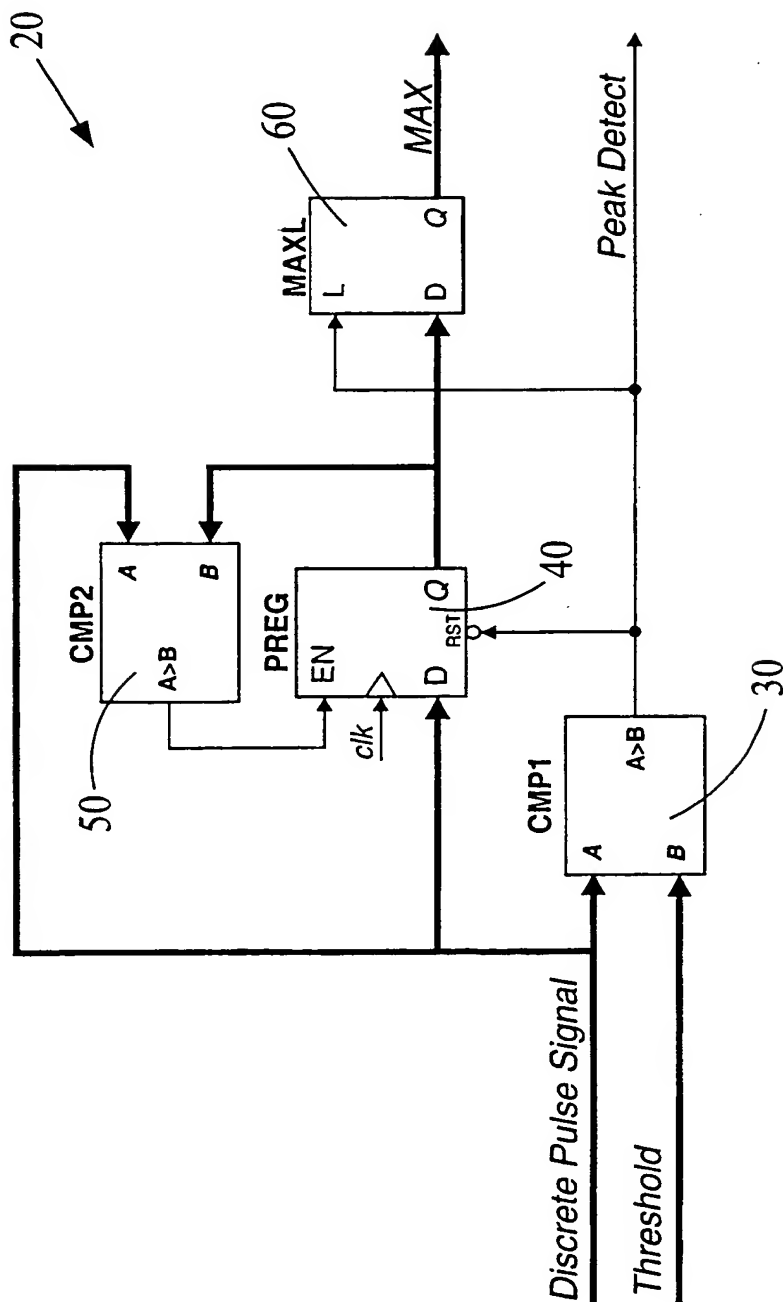


FIG. 1  
(Prior Art)

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/27501

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H03M 1/18  
US CL :341/132, 139

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 341/132, 139

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

West:

search terms: peak, detect\$, minimum, maximum, select\$, multiplex\$, swithc\$

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,E	US 6,100,829 A [FREDRICKSON et al.] 08 August 2000, (08/08/00) Fig. 3.	1-9
A	US 5,254,995 A [HANTKE] 19 October 1993, (19/10/93) figs. 1, 3.	1
A	US 4,769,613 A [SAWATA et al.] 06 September 1988 (06/09/88) ALL	1
X	US 4,827,191 A [CHAPMAN] 02 May 1989, abstract, figs. 1 - 3,	2, 3, 4
--	col 1, line 60 to col 2, line 14, col 2, lines 37 - 54	-----
Y		5 - 9
Y	US 5194865 A [MASON et al.] 16 March 1993, abstract figs. 1, 2, 3, 4.	5, 6, 7, 8



Further documents are listed in the continuation of Box C.



See patent family annex.

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Special categories of cited documents:

\*T\*

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*A\*

document defining the general state of the art which is not considered to be of particular relevance

\*X\*

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*E\*

earlier document published on or after the international filing date

\*Y\*

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

\*L\*

document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\*

document referring to an oral disclosure, use, exhibition or other means

\*G\*

document member of the same patent family

\*P\*

document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search

18 DECEMBER 2000

Date of mailing of the international search report

16 JAN 2001

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/27501

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,210,538 A [KUROIWA] 11 May 1993, figs. 1 - 4, abstract, col 1, lines 32 - 65, col 2, lines 32 - 45.	5, 6, 7, 8,9